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Critical Interventions Into the Corporate Smart City

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Abstract

Driven by the profit motive of global high-technology companies, in collusion with the trend towards city governance being wedded to a competitive form of 'urban entrepreneurialism', has left little room for ordinary people to participate in the smart city. The article seeks to make a two-fold critical intervention into the dominance of this corporate smart city model. It does this by first looking at how we currently understand the smart city, and critiques the growing trend towards corporate and entrepreneurial governance versions. A second form of intervention concerns considering smartness from different perspectives emanating from small-scale and fledgling examples of participatory and citizen-based types of smart initiatives.

Key words: intervention, corporate, entrepreneurial , governance, inequality, smart

JEL codes: F63 H75 R51 Z13

Introduction

Urban development led by the application of information communication technologies (ITCs) has emerged as an important discourse in relation to the future growth, efficiency and prosperity of cities. Numerous examples abound in both the popular media and in academic discussions. Entire cities, based on smart principles, are currently being constructed in Asia and the Arab world by giant corporate IT, engineers and building firms, while smart initiatives have become common-place across the USA, Europe and Scandinavia in the last decade. Allegedly motivated by population flows, cities as economic growth hubs, and environmental concerns, the smart city is currently being constructed as the solution to many urban problems, including crime, traffic congestion, inefficient services and economic stagnation, promising prosperity and healthy lifestyles for all. In short, the smart city symbolises a new kind of technology-led urban utopia (Kirby, 2013; Townsend, 2013).

It is counter-intuitive to argue against the idea of a smart city (though for recent critiques see Vanolo, 2013; de Lange and de Waal, 2013; Townsend, 2013, Hemment and Townsend, 2013; Greenfield, 2012; and for an early critique see Hollands, 2008). And there is little doubt that ITCs are significantly transforming urban life (though this is hardly a new idea, see Williams, 1983; Graham and Marvin, 1995). Despite its inherent positivity, in a recent

commentary, the renowned urban sociologist Richard Sennett has questioned the logic of the smart city and the largely accepted notion that we should increasingly rely on the use digital technology to plan our urban environment. Using examples like Masdar, United Arab Emirates (UAE) and Songdo, South Korea, Sennett (2012) suggests that the 'danger now is that this information-rich city may do nothing to help people think for themselves or communicate well with one another'. In a similar vein, a 2008 article concluded: '...the smart city generally reflects some of the negative effects the development of new technological and networked infrastructures are having on cities (Graham and Marvin, 2001), and is politically inclusive and culturally creative in only limited ways' (Hollands, 2008: 304).

These critical remarks raise a series of important and underlying questions about the self-congratulatory nature of the smart city, and how ideas about this new urban panacea are currently being promulgated. For example, what do we actually mean by the term, and precisely what elements go into making up a smart city? What underlying ideological assumptions are made by invoking the concept, and what are its central social contradictions and problems? Who, and what, is driving our pre-occupation with the smart city, and who stands to gain and lose in the race towards such an urban future? Are there different and more critical ways of understanding current trends and conceptions of smart cities? And finally, are there other more cooperative and participatory uses of new technology that show glimpses of another kind of smartness that might provide a counter-point to current conceptions?

The main argument of this article is two-fold. First, as previously argued (author name removed), the idea of the smart city continues to be a highly ideological concept, hiding certain issues and problems from view, while assuming that information technology can automatically make cities more economically prosperous and equal, more efficiently governed, and less environmentally wasteful. Secondly, the way in which this urban panacea is increasingly being packaged and promoted, is that it can only be effectively delivered through a corporate vision of smartness, in conjunction with an entrepreneurial form of urban governance (Harvey, 1989), and a largely compliant and accommodating citizenry (Gabrys, 2014). While the rhetoric of the corporate smart city invokes its own limited notion of participation and democratic decision-making, the profit motive of global information technology, software, engineering, construction, and utilities companies (Hill, 2012; Haque, 2012), in collusion with the trend towards cities selling themselves and being 'open for business', has left little room for ordinary people who live in cities to do anything other than adjust to the conditions of what one analysts has called smartmentality (Vanolo, 2013).

This argument entails a two-fold intervention into the debate surrounding the rise of this corporate-oriented smart city. First, it looks critically at how we currently understand the smart city. While there are clearly different definitions, variations and scales of smart cities and initiatives, this article specifically focuses on the rising trend towards corporate and entrepreneurial governance versions. A second form of intervention concerns considering

smartness from a different perspective, emanating from small-scale and fledgling examples of participatory and people-power type of smart initiatives (Brickstarter, n.d.; Chatterton, 2013; de Lange and de Waal, 2012; Radywyla and Biggs, 2013). These modest examples are derived from what Adam Greenfield (2012), founder and managing director of Urbanscale, has called the 'spontaneous order from below' in his writings on the information-based city, while de Lange and de Waal (2013) use the term 'social cities' to refer to case of using urban technologies to collaboratively solve shared problems.

The purpose of discussing these few examples is not to suggest that they pose a readymade alternative to the corporate vision. The problem in urban sociology generally is there appears to be a distinct lack of an alternative to the neo-liberal city, smart or otherwise (Harvey, 1989; though see Harvey, 2012; also Hudson's 2010 notion of resilient regions). Rather, their purpose is to provide a glimpse into different and more human versions of smartness (using technology to realise progressive ideas, rather than see the technology as progressive in and of itself (de Lange and de Waal, 2013)). Really smart urbanism needs to start with the city itself and its attendant social problems, rather than looking immediately to smart technology for answers (Hoornweg, 2011). This will require new participatory urban technologies, greater social and economic inclusion, and a substantial shift in power from corporate business and entrepreneurial city leaders, to ordinary people and communities that make up cities (Harvey, 2012).

Understanding the smart city concept: Visions, elements, trends

Ideas about future urban development are closely entwined with discussions about the dramatic impact ICTs will continue to have on our lives in the 21st century, and nowhere is this more evident than in the idea of the smart city. Note the following futuristic scenario:

> Imagine life for the citizen of the smart city: you awake in your sustainably built home, and take your morning shower in recycled industrial waste water, cost-efficiently heated overnight. Eating breakfast, you scan the flat screen, fed by maximum bandwidth internet, where the special, easy click local neighbourhood menu allows you to compare your daily energy use with other houses in the area, confirm your webcam appointment with your doctor, top up the balance of your all-purpose travel card, order your groceries and leave messages for your child's teacher. You can even watch television on it. Outside, your electric car is waiting. On the edge of the central congestion zone, you park in a charging area and, paying with your travel card, get into a three-wheeled utility vehicle which, via a network of special lanes and sensor-controlled pedestrianised areas, delivers you to another parking dock at your workplace (Kirby, 2013).

Other examples of transformed lives in smart cities come from IT corporate websites, futuristic films, and academic and policy-making circles. Fujitsu, a leading Japanese ICT company says it is '... striving to leverage ICT to create a society where people's lives are prosperous and more secure' (Fujitsu, n.d.), while Cisco, which has been involved as the IT partner in the creation of the first smart city from scratch in South Korea, Songdo, says on its website that it '...is a prime example of a new city that brings together the world's best technologies, building design and eco-friendly practices to create the ultimate lifestyle and work experience' (Cisco, n.d.). Finally, the ICT powerhouse IBM on its website claims that 'Smart growth can lead to safe neighbours, quality schools, affordable housing and traffic that flows. It's all possible...' (IBM, n.d.).

Popular cultural images in the form of futuristic films are less flattering and more concerned about the negative impact technology can have on our urban lives. While the *Terminator* series of movies is perhaps the most obvious dystopic representation of what happens when the machines (computers) take over[i1], films like *Equilibrium*, *Bladerunner* and *Minority Report* also raise important issues about information technology and its relationship to urban privacy, security, and hyper-consumerism. While these movies essentially make a technological critique (i.e. technology can sometimes go wrong), equally apt here is the less well know Indian film *Smart City* (2006), which is based, in part, on a fictional take on a real but ambitious/ Info City plan drawn up by the previous Kerala government in partnership with Dubai Internet City. Interestingly, the film emphasises the conflict between local mafia, builders, property developers and government in building a smart city, and is perhaps more in line with academic critiques of corporate and government collusion in creating an entrepreneurial type city (Hollands, 2008; Harvey, 1989).

Discussions about smart cities in academic circles are of course more varied, diverse and complex than these corporate utopian visions or cinematic false dawns. Part of this more complex understanding comes down to the varied ways the term has been employed, or linked to related concepts. For example, while the adjective smart clearly implies some kind of positive urban-based technological innovation and change via ICT's, analogous to the 'wired', 'digital', 'informational' or 'intelligent' city, it is not, as has been argued elsewhere, exactly synonymous with these terms (author name withheld). More recently, some writers have begun to talk about the ubiquitous or 'u-city', where smart technology is completely embedded in the urban fabric and all urban systems become linked through IT advancements (Anttiroiko, 2013). Smart initiatives have also been discussed in relation to a range of ideas including e-governance (Van der Meer and Van Winden, 2003), the efficient production of urban services (Comestock, 2012), the learning or knowledge city (MacFarlane, 2009; Campbell, 2012), their link to creative cities (Florida, 2010), smart communities (Paquet, 2001), and more recently, open data sharing in cities (Bates, 2013). Additionally, while smart cities discourses were always tied up with issues of environmental sustainability, and often used as an important driver for smart city initiatives (Satterthwaite, 1999), this connection has become both stronger and more urgent with studies of climate change in

cities (Bulkeley, 2013), urban transitions to low carbon output (Bulkeley et al, 2010), and increased discussions about eco or green cities as smart (Joss, et al, 2013; Beatley and Newman, 2008).

This diversity of ideas creates certain conceptual problems in discussing smart cities, as different writers invoke quite varied aspects in their definition of the term. For example, some view smartness almost exclusively as technology and hardware - 'We define the SMART city therefore as “resources and technology that interoperate in real time across city functions...”' (Moyser, 2013). Others emphasise urban governance and services:

> At its most basic level, a city is comprised of a government (in some form), people, industry, infrastructure, education and social services. A smart city thoughtfully and sustainably pursues development with all of these components in mind with the additional foresight of the future needs of the city (Comstock, 2012).

Still others use definitions that given primacy to smart technologies that reduce our energy consumption and environmental footprint (Cohen, 2012), while the Centre for Regional Science (2007), utilise a range of measures in ranking smart cities, including six main smart characteristics - economy, people, governance, mobility, environment, and living - possessing 31 factors, and having 74 indicators that they can be measured by.

Effectively a smart city is made up of information technology devices, industry and business, governance and urban services, neighbourhoods, housing and people, education, buildings, lifestyle, transport, and the environment. Because it is made up of such a diverse range of things, the smart city idea can inadvertently bring together different aspects of urban life that do not necessarily belong together, hiding some things and bringing others to the ideological fore. For example, the unspoken assumption in the corporate quotes above, suggests that the application of information technology in cities will automatically benefit everyone, with prosperity and wealth being shared by all. Or that we all roughly share the same kind of smart city vision, exemplified by the speech by Samuel Palmisano (2010), the former Chairman and CEO of IBM, who ideologically suggested that: 'Building a smarter planet is realistic precisely because it is so refreshingly non-ideological'. Overall, common uses of the term lack a critical edge, displayed through its ignorance of the complexity of urban problems and processes. Others have argued that smartness can also become a self-imposed label, a marketing device for city branding and an excuse for the domination of corporate urban entrepreneurialism models (Hollands, 2008). What more do we know about smart cities today and what new trends are evident in the literature?

First, it clear that there are still a plethora of examples of smart cities and smart city initiatives that one could highlight, which implies that it continues to be a significant urban development. Popular examples abound on the internet, from large-scale grand plans like Singapore's iN2015 (intelligent nation) project, Songdo, South Korea's purpose built, globally competitive, high-tech, environmentally sustainable, business city, or Guangzhou

Knowledge City in China, designed to attract talent, skilled manpower and knowledge-based industries. Masdar City, in the UAE, is currently being designed as an 'oasis of the future' (quite literally as it is built in the desert) and intended to become the world's first sustainable, renewable, energy-powered cleantech cluster (Smart City Asia Congress, 2012). In Scandinavia and Europe, Helsinki and 'Intelligent' Thessaloniki (Greece) are held up as examples of encouraging the development of new mobile applications utilizing open data, and using IT to increase competitiveness and sustainability, respectively (Komninos et al, 2013). In Europe, Barcelona, continues to be renowned for its Smart City Model and in November 2014 will host its fourth Smart City Expo World Congress in as many years (see http://www.smartcityexpo.com/), while the Amsterdam Smart City initiative is held up as the example of how to retrofit a city to improve living and economic conditions, and reduce carbon emissions (Kirby, 2013).

Closer to home, Manchester's FutureEverything programme is meant to make them the world's first 'open data' city (though Edmonton, Canada seems to have already claimed the title, see Kirby, (2013)), while Glasgow has recently won £24m from the government to demonstrate how a smart city of the future might operate (Wakefield, 2013). Even struggling cities like Sunderland are getting in on the act, with the CEO of the council saying: 'I see this opportunity through smarter cities as being the next revolution' (Kirby, 2013). The proliferation of smart cities and smart initiatives is such that it has even resulted in a world rankings table. According to Boyd Cohen, a UK climate specialist, Vienna ranks first in the top ten smart cities ranked across a range of criteria, including innovation, quality of life, level of greenness and digital governance, followed by Toronto, Paris, NY, London, Toyko, Berlin, Copenhagen, Hong Kong, and Barcelona (Cohen, 2013).

The question is what does this proliferation of examples tell us - that there are lots of quite different initiatives, or as Hollands (2008) predicted, there would be a bandwagon effect? While the 1997 World Forum on Smart Cities estimated that around 50,000 cities and towns around the world would develop smart initiatives over the next decade, there is little evidence today which verifies this rather hopeful figure. IBM, for example, more modestly claims involvement in more than 2,000 smarter cities projects worldwide, while Pike Research suggests they are currently tracking around 130 projects which are ongoing (Navigant Research, n.d.). ABI Research suggested that there around 102 smart city projects worldwide, with Europe leading the way with 38, North America 35, Asia Pacific at 21, the Middle East and Africa at 6, and Latin America with 2 (Schelmetic, 2011).

Although we might be increasingly surrounded by the discourse of smartness, the development of initiatives is perhaps more uneven and slower than once envisaged. It is also the case that there is a critical difference between the scales adopted. For example, Songdo is an ten year, $40b urban development the size of Boston, while Stratford Ontario (population 32,000), has been named one of the world's Top 7 Intelligent Communities by the Intelligent Community Forum three years in a row (see StratfordSmartCity (2013)). Many

of the smart city examples existing on the internet are specific and varied initiatives rather than full blown programmes, and there are very different national and international patterns of smart development, all of which need further unpacking.

According to the dominant discourse, the smart city idea is currently being driven by three inter-rated factors: population demographics, the role of cities as economic drivers, and sustainability. Nearly 60% of the worlds' population now lives in cities, and there has been nearly a 10% increase in populations of cities greater than 5 million (Kirby, 2013). However, these figures are largely driven by hyper-urbanisation in Asia (where 40m people add to city populations per year), particularly in China (who by 2025 will have over 220 cities of one million, see McKinsey Global Institute, 2011: 1). However, a second factor has been that due to global economic competitiveness, cities have become economic hubs and drivers and it is estimated that by 2025 the largest 600 cities worldwide are projected to account for around 60% of global GDP (McKinsey Global Institute, 2011:1).

Many accounts of smart cities also cite the urgent need for environmental solutions as urban areas consume 75% of worlds energy and are responsible for 80% of greenhouse gas emissions. Pike Research tracking organisation suggests more than 50 percent of projects they are assessing have focused on innovations in transportation and urban mobility (Navigant Research, n.d.), and ABI Research estimated that smart grids accounted for 36 percent of total smart city expenditures in 2011 (Korzeniowski, 2012). The European Smart Cities Initiative is also focused on the sustainability issues of cities and, more specifically, on their energy systems (European Commission, 2010), as do many Scandinavia projects, with Copenhagen aiming to be the worlds' first carbon neutral capital (Copenhagen Cleantech Cluster, n.d.) Many of the mega-developments in Asia and the UAE are based on environmental sustainability as their rationale, though one needs to factor in construction energy costs to build them.

However, while it might be argued that environmental sustainability is in itself progressive, it might also be suggested that it can be used to disguise another significant and growing force behind smart cities. And that is a combination of aggressive marketing strategies and huge profits to be made by major corporate ICT firms, engineering, property development and construction companies. For example, Pike Research forecast that the global smart city technology market will be worth over $20 billion US annually by 2020 (Navigant Research, n.d.) while ABI Research suggests a larger figure of $39b by 2016 (Korzeniowski, 2012). As Dan Hill, CEO of Fabrica, a communications research centre, has argued, this 'Urban Intelligence Industrial Complex' (led by IBM, Cisco, General Electric, Siemens, Philips, amongst others) has emerged and has strongly inserted itself, and its corporate priorities, into current urban development models (Hill, 2013). Even Eurocities (2012:2), who works with these giant companies, state that: 'Too much of the smart city agenda so far has been led by producers; competing corporations offering their own technology to cities as an ostensibly comprehensive solution to every urban 'problem''.

Yet, it is not just the profit motive and new ICT markets that are of interest sociologically, but the 'techno-utopia' that accompanies this kind of future. Spun by the CEOs and smart city technocrats of corporate ICT companies is a narrative imbued with images of technologically-led progress, efficiency and prosperity for all. As Anttiroiko (2013: 3), writes: 'What is envisioned are futuristic cities which will offer a high quality of life for residents in terms of security, welfare, culture and entertainment, and other aspects of everyday life.' What is interesting here is not only the inevitability of the technological revolution, but the way in which such a corporately-envisaged urban work, leisure and consumption future is assumed to be what we all want, and in everyone's interest. The next section turns to a more formal critique of what might be called the 'corporate' smart city model, which it is argued, is a growing global trend requiring closer analyses.

The rise of the corporate smart city: A critical appraisal

Previously it has been argued that a main element characterising many self-designated smart city initiatives were their underlying emphasis on business-led, entrepreneurial or corporate urban development (author name withheld). While there are significant international differences here, with regard to how far this process has happened, it is equally clear that the general trajectory of what Michelle Proovest (2011) calls 'neo-liberal urban utopias', is certainly on the rise.

The most well developed examples of business involvement in moulding the smart city is where large ICT and property development corporations have had almost total control in building and designing whole entities, and not surprisingly this has tended to occur in places like Asia where neo-liberalism is well advanced (Lima and Jang, 2006; Keeton, 2011). One of the most well known examples of this is the involvement of giant ICT corporation, Cisco, and US property development company Gale International, in the creation of New Songdo City, South Korea, a metropolis the size of Boston being built on a man-made island in the Yellow Sea. To quote Jean-Louis Massaut, Director, Smart + Connected Communities, Cisco: 'We map what user experience do you want to have for the people who are working in the city or people who are living in the city' (Cisco, n.d.). While not fully completed, the city contains commercial buildings, shops, municipal buildings, condos, offices, and South Korea's tallest building, the 1,001-foot Northeast Asia Trade Tower. Designed to be a LEED-certified green city, it will produce only one-third of the greenhouse gases of a traditional city of the same size (Schelmetic, 2011).

Despite this latter progressive sounding credential, and the claim on the Cisco website that the 'Songdo project is a model for smart cities around the globe' (Cisco, n.d.), perhaps as illuminating is the comment from Stan Gale, Chairman, Gale International that: 'The concept behind it is that this would become the central focal point and a main alternative for large-scale companies looking to do business in Japan, China and Korea' (Cisco, n.d.). Essentially,

Songdo is a giant business park, not a city per sa. The development is set out in effect to produce an ideal corporate 'lifestyle and business experience' (Cisco, n.d.), with the idea that people can come in from overseas, and live, work and leisure completely within corporate spaces. Everyday urban life comes complete with home/ office/ educational/ government interface systems (unfortunately called Telepresence), a Jack Nicklaus designed golf course, and corporate shopping areas.

This is hardly a one off experiment. Once New Songdo City is finished, its builder plans to roll out 20 new cities across China and India, presumably with Cisco in tow to build the city's central brains. Other giant corporations also see the smart city idea as both a driver of urban change and a source of future profits. For example, Fujitsu, the leading Japanese ICT company with revenues of $54 billion US, argues on their website:

> The Fujitsu Group will promote smart cities as an impetus for social change. In line with its long-term vision of realizing a Human Centric Intelligent Society, the Fujitsu Group is striving to leverage ICT to create a society where people's lives are prosperous and more secure. Amid an ongoing population shift to cities worldwide, we are aggressively promoting smart cities as a driver for social transformation (Fujitsu, website, n.d.)

In 2008, in the midst of the banking crisis, the high-tech giant IBM re-branded itself via a Smarter Planet initiative as a lynch-pin of its growth strategy, holding 100 Smarter City Forums around the world, and now claims to be involved in around 2000 smart projects worldwide. This strategy has clearly paid off, generating $3 billion (double digit growth in this area), from nearly 6000 clients. Currently 25% of IBM's operations are in smart area, and this is set to double over the next few years (IBM website, n.d).

Numerous other large-scale smart city projects exist, namely Masdar, in the UAE and PlanIT Valley in Porto, Portugal. While the UK has nothing on this scale, more discrete examples of it are beginning to emerge. LandProp, a property offshoot of InterIkea, the parent company of the well known furniture store, is currently developing a mini-city called Strand East in East London (Beanland, 2012). Urban writer Anna Minton, in her fascinating book *Ground Control* (2009), has been arguing that public spaces in many UK cities have been increasing privatised and turned over to corporate control, with ill effects. Other critics are unhappy about the idea of future smart cities growing up entirely around corporate power and money, and stress that it is social and urban development that happens after the technology is put in, that is crucial to the liveability and sustainability of these cities (Schelmetic, 2011).

No less significant examples of corporate influence on urban development connected to the use of smart technology, is in the area of advertising and consumerism. Akin to the futuristic movie, *Minority Report*, where Tom Cruise runs through a mall as the advertisements around him change to tailor exactly to his tastes, Immersive Labs, a start-up tech company, will shortly trial its first camera-enhanced 'smart signs', equipping billboards and retail

signage in places like airports, malls and retail stores with the ability to compute what type of consumer is looking back: male or female, young or old, a sports fan or a pet owner (Curry, 2011). Researchers at IBM have also revealed they are also working on technology which will lead to consumers being shown tailor made adverts that reflect their personal interests via the RFID they carry around with then in phones and credit cards. They claims that such billboards are being developed as part of their Smarter Planet programme that aims to use technology to make people's lives easier and more efficient (Gray, 2010). Engineers in Japan from the electronics company NEC have already developed a billboard that is capable of identifying a shopper's age and gender through facial recognition software, as they walk past to offer them products that are more accurately suited to them (Gray, 2010).

Why are we seeing a trend whereby our cities are increasing becoming a backdrop to corporate advertising and the privatisation of public space? And why are city leaders eager to hand over cash and control to business-led smart urban development? The urban geographer David Harvey (1989) noted a significant global shift in forms of city governance back in the mid-80s away from a managerial welfare one, to one of urban entrepreneurialism. Strapped for cash, cities began to compete with one another in attracting in global capital and marketing themselves as world leading cultural, creative or smart brand cities. With the global banking crisis of 2008, followed by a nearly world-wide politics of austerity, this governance trend has continued with an increased emphasis on efficiency savings, privatisation and the promise of a high tech future. As corporate ICT companies themselves have noted:

> ...in the 21st century, cities compete globally to attract both citizens and businesses. A city's attractiveness is directly related to its ability to offer the basic services that support growth opportunities, build economic value and create competitive differentiation (...) They are looking for smarter cities (IBM, 2012).

There are different international patterns of entrepreneurial governance, privatisation, and corporatisation here, all of which impact on the scale and direction smart initiatives take. For instance, while North American and European governance models are still entrepreneurial in the Harvey sense (Harvey, 1989), democratic controls and privacy/ security concerns, may mean that there are more cautious and nuanced examples of cooperation between city governments, citizens and business. Hudson (2010) also talks about the notion of 'resilient regions' and discusses some of the ways in which places can begin to push against the effects of new-liberal capitalist development. However, as Anttiroiko (2013: 7-8) has argued, in places like Japan and South Korea, there is much more direct collusion of corporate and local government interests, a longer history of the privatisation of national telecommunications systems, and more examples of all encompassing ubiquitous smart developments. As Anttiroiko (2103: 8) states:

> They favour big projects which are set-up on a partnership basis as a collaborative effort of governments and businesses. Also, the use of mobile services in these countries concentrates on entertainment and is provided almost solely on a commercial basis.

For example, Korean Telecom, involved in Songdo, was once a public corporation but become as privatised in 2000, and then became a major driver of the u city concept which emerged in political circles there in 2004 (Anttiroiko, 2103: 8). A similar form of privatisation occurred prior to the Singaporean government launching the Intelligent Nation 2015 (iN2015) program (see Hollands, 2008: 312), whose aim is to transform the country into an intelligent nation and a global city.

A key question raised here about information technology and public-private smart partnerships, is who gains and who loses through such arrangements? Regarding the creation of Smart Grids for example, putting the necessary IT infrastructure in place requires a significant investment. The Stockholm Royal Seaport project for example, came with a preliminary price tag of $2.9 million, with the Swedish Energy Agency paying $1.2 million and Vinnova, the Swedish Governmental Agency for Innovation Systems, contributed another $700,000, while the remaining funding (around a third) came from the participating vendors (Korzeniowski, 2012). Another example concerns Sunderland Council's £5.7m investment in the Sunderland Computing Cloud. While, they have suggested that they would recoup their investment in five years' time due to 'efficiencies in services' and through a boost in the IT economy in the region (Parnell, 2011), at the same time the council had cut 1500 jobs since 2009 and in 2013 was making cuts of £37m (£3.8m to child services and £5.1m to health, housing and adult services (*Sunderland Echo*, 2013). In the wake of urban austerity, it is unclear to what extent local and national governments can continue to foot the bill for public-private partnerships and effectively subsidise private industry in the smart field, when council cannot even provide basic urban services for the majority of people who live in cities (Korzeniowski, 2012; Hoornweg, 2011).

A final question not really raised in the literature, is to what extent the corporate entrepreneurial smart city, '.... is in its fragmented mode a new way of building functionally sophisticated enclaves into society, which tends to serve mainly high value adding activities and high income people?' (Anttiroiko, 2013: 13). Serious urban problems like poverty, inequality and discrimination appear to be largely absent from these neo-liberal urban visions and projects, and there appears to be little or no recognition that smart developments might contribute negatively to social polarisation in cities (what Graham and Marvin (2001) have referred to as 'splintering urbanism'; also see Graham, 2002). In the main, most smart initiatives envisioned here come from either corporations or urban governments, not from actual people who live and work in cities. In fact, it might be argued that citizens are often cast as barriers in the corporate race towards the smart city and that they need to be educated by city leaders as to the benefits information technology can bring

(Greenfield, 2012 also makes this point). This lack of concern with democratic decision making, and real citizen involvement, participation and control of most smart city projects, have led urban critics to search for different ways to think about smartness, and to explore smaller-scale, community-based and more socially progressive uses of new technologies.

Interventions in the corporate smart city: Glimpses of possibilities?

While both definitions of and practices surrounding smart cities and smart initiatives are not a monolith, the argument made so far is that there is a growing tendency for them to be technologically-led, corporately influenced and tied to competitive models of the entrepreneurial city identified by Harvey (1989). This is especially the case with regard to Asian models of the corporate ubiquitous city, although as Provoost (2012) has argued, smaller-scale models of this type are also being trialled in Europe. Previous research into a number of smart city initiatives in Europe and North America showed that a significant proportion were undertaken by city governments for urban marketing/ branding purposes (Hollands, 2008), rather than being citizen-led. This is not to suggest there are no well-meaning and progressive initiatives out there, designed to solve pressing urban problems related to things like urban decline, transport issues, or making cities more carbon neutral. However, there exist no large-scale alternative smart city models, partly because most cities have generally embraced a pro-business and entrepreneurial governance model of urban development, and hence are subject to many of the same kinds of criticism that might be made of the more extreme, corporately organised u-city type (Anttiroiko, 2013).

Another problem in defining what might be meant by alternative, is whether or not we are talking about future visions or immediate practicalities? Generalised alternative urban visions, for example, tend to be rather vague and utopian models arguing for a sustainable resource, not money-based, world economy (see the ideas of the Zeitgeist Movement and the Venus Project for example[ii]). Similarly, there exist tactical technologically-based movements, such as the International Pirate Party, who has campaigned for open copyright, and the use of the social media to get issue petitions and consensus-based decision-making on the table. Still others have emphasised challenging the corporate grip on information technology through the provision of free software (Kelty, 2008), or politically challenging the status quo by creating loosely associated networks of ‘hacktivists’ and 'cyber guerrillas' (like the group Anonymous, amongst others, see Ronson, 2013). While the difficulty facing groups like Zeitgeist and Venus is the lack of feasibility of a resource-based approach in light of the dominance of neo-liberal global capitalism, the weakness of the second approach is ironically its exclusive use of technology as a basis for political action.

Perhaps more instructive, would be to examine a range of more modest and small-scale socio-technological interventions that contrast with that of the corporate smart city, and which might begin to help us envisage a different way of thinking about and 'doing'

smartness. Before turning to a brief discussion of four examples, it might be useful to outline a few basic differentiating principles. For instance, one of the most important principle to start with here is the need to begin to move away from the idea that technological solutions, in and of themselves, are the only viable (and easiest) way to solve our many urban problems. Cities face a myriad of problems and contrary to prevailing ideology, not all of them are amenable to technological problem-solving or more sophisticated data-gathering (Hoornweg, 2011; Hill, 2013). Second, we need to shift the debate about smart cities towards the raison d'être of cities - the people and citizens who live in them (Hill, 2013). Thirdly, as de Lange and de Waal (2013) have argued, one of the key elements of imaging a different kind of smartness concerns ideas about ownership, not limited to proprietorship, but rather in their words 'how to engage and empower citizens to act on complex collective urban problems'. This involves starting with urban citizens taking responsibility and acting collectively, but also raises issues of social learning, reliance and social cooperation. For Hudson (2010), this requires using human capabilities to reduce social risks, while at the same time affording socially useful and environmentally enhancing activity much greater recognition and significance.

There are, of course, many examples that might fulfil most aspects mentioned here, and the difficulty is always which projects to highlight. The brief discussion of four cases below is not meant to be in any way exhaustive or comprehensive, but rather instructive. Similarly, it is important to understand these examples in the context of the principles just mentioned, rather than writing them off as anti-technical or simply as 'sustainability projects'. They all use technology in some way to help solved urban problems - however, its use supplements and supports progressive and smart solutions based on collective ideas, action and resilience, rather than starts with the technology as the driving force (de Lange and de Waal, 2013).

Many of these ideals are contained in the fledgling urban crowd-source idea called Brickstarter. According to their web-site, they are: '…sketching a system that would enable everyday people, using everyday technology and culture, to articulate and progress sustainable ideas about their community' (Brickstarter, n.d.). The general philosophy behind this new initiative is to utilise social media to be more responsive, representative and educative in transforming grass roots urban proposals into viable projects (what they call YIMBY - yes in my back yard). One commentator has suggested that it could make 'citizen-based urban planning a reality' (McGuirk, 2012). Their prototype IT platform invites and advises groups how to negotiate their way through what Brickstarter calls the 'dark matter' of local city planning, and more important how they might be able to fund such a project, through a kind of urban crowd-funding/ sourcing platform. While there remain issues over the eventual operationalisation of the Brickstarter platform (only a basic prototype exists - click link at bottom of their webpage at: http://www.helsinkidesignlab.org/dossiers/brickstarter), not to mention the problem of involving poorer urban dwellers and crowd-sourcing becoming part of the neo-liberal

costing cutting agenda (McGuirk, 2012), there are also distinct possibilities raised here regarding citizen involvement in urban issues.

A actually existing project combining a energy efficient technology with a community focus, is the Leeds housing project LILAC (Low Impact Living Affordable Community). In an effort to solve the twin problems of affordable yet ecologically sustainable housing, as well as encourage cooperative community-based living, LILAC has become the UK's first Mutual Home Ownership Scheme. Funded by an eco-friendly bank and a grant from the Homes and Communities Agency (on a site sold to them at a reduced rate by the council), resident households pay 35% of their income into a trust thereby acquiring equity shares, enabling even those in incomes of £15,000 to get on the housing ladder (Wainwright, 2013). In terms of using sustainable technology, the project aims to be as low carbon as possible as the houses are of wooden construction with straw bale insulation, rainwater collection, energy efficient heating, minimal car spaces/ and a shared tool shed. Community-wise, LILAC has been designed with communal values in mind with a common area with shared kitchen, laundry, workshop, meeting/ function room, as well as each unit have their own allotments to grow food (see Chatterton, 2013). While the project no doubt waded through a lot of local authority 'red tape' to get the project off the ground, it is an excellent example of a grassroots initiative, where people not corporations or politicians control their urban lives, and is a potential model for providing affordable and sustainable housing in other areas of the UK. Recently they have won two city architectural awards.

De Lange and de Waal (2013) on the other hand, do not focus much on community initiatives or forums, but what they call 'networked publics' and they examine a range of examples here from data commons, media art projects, to DIY urban design. Regarding this last category here, they argue that digital media can help enable collective action. The example they discuss is an interesting project called *Face your World*, set up by two artists, which invited young people and neighbours living in an Amsterdam neighbourhood to collaborate in producing an virtual vision of their local park, which they used to persuade the local government to adopt in place of their own plan (de Lange and De Waal, 2013). In their longer e-publication on ownership in the hybrid city, de Lange and de Waal (2012:25), suggest that the '…project brought together a variety of urban issues including urban regeneration, practical education, community participation and art in public space'.

A final example combining information technology and social media with sustainability, is 596 Acres, a project designed to turn Brooklyn's 596 acres of public owned land into common use by a range of community groups and individuals. Its IT online platform, effectively a 'knowledge commons', has been crucial in building this intervention, connecting people to each other, matching skills, and sharing experience and information about how to transform vacant lots into sustainable growing plots (Radywyl and Biggs, 2013). The implications of projects like this are not however, just about using technology for progressive politics or developing skills, but are also crucial for building social capital,

community, and urban sustainability. Eizenberg's (2013) excellent book *From the Ground Up* is a study of 650 community gardens in New York city, which are managed collectively by some of cities least well off residents for purposes of horticulture, recreation, social gatherings, and artistic and cultural events. She argues that these community gardens create not only ecological spaces but 'organic urban residents' and actors, making a city in their own image. What is being argued here is that alternative smart projects are smart by virtue of solving a number of urban problems simultaneously (community spirit, social capital, sustainability, availability of fresh and affordable food, etc), rather than just being technological planning devices.

All of these examples exemplify not just a 'right to use technology' which is precisely where many smart city initiatives stop, but rather the right to shape the city using human initiative *and* technology for social purposes to make our cities better and more sustainable. This idea has a number of implications. First, smart initiatives do not have to be large-scale and costly or always motivated by corporate profit-seeking or competitive city brand-makers. Selling high-tech ideas and hardware to cities is expensive and may only benefit the few, argues Hoornweg (2011), when there are a range of more worthy and inexpensive human interventions and basic services that can be supported and enhanced IT to encourage cooperation, community and sustainability.

Second, as Michael Andrew McAdams (2013) suggests: '...It would seem obvious, but a "smart city" must be inhabited by "smart people"' (see also Hemment and Townsend's 2013 e-book on smart citizens). This requires, in his view, open access to an excellent system of education, including university level, in order for people to more engage democratically with intelligent technology. Similarly while there have been suggestive discussions about smart citizens (Hemment and Townsend, 2013), the need for smart communities (Paquet, 2001), and ideas about the city as a 'learning machine' (McFarlane, 2009), and 'urban knowledge hubs' (Campbell, 2012), in the main, existing smart city models tend to see citizens as a barrier to the implementation of smart technology (due to technological ignorance or lack of education), or just as another resource as in human capital type approaches. Smart, in this framework, is limited to being able to access, consume, and use the new technology to a certain degree, but not to question it or attempt to shape and contour its uses. For the citizen, smartness becomes reduced to a form of smart mentality, simply adopting the right frame of mind to accept and cope with the inevitability of urban technological change.

Hoornweg (2011) argues: 'At its core a smart city is a welcoming, inclusive city, an open city. By being forthright with citizens, with clear accountability, integrity, and fair and honest measures of progress, cities get smarter. A smart city listens – and tries to give voice to everyone'. We need to ask if current visions of corporately-led smart cities actually do this, and if not, consider what other interventions need to be adopted if they are to begin to move in this direction.

Conclusion

As Sennett (2012) states: 'We want cities that work well enough, but are open to the shifts, uncertainties, and mess which are real life'. I would go further than this, and go back to the everyday scenario this paper began with, with Kirby (2013) describing everyday life in a technologically-led futuristic smart city. While life here is efficiently organised and even environmentally sustainable, it is unclear what role citizens, and indeed government and corporations have played in its creation. It also fails to even hint at the answers to basic sociological questions like: Is this person happy with their life?; Do they have a good relationship with their neighbours and community in their smart city?; Do they enjoy the work they are transported to in their electric pod?; What free cultural and social amenities are provided by the city they live in?; Do they have a good standard of living and do they, more importantly, live in a fair city?. The technologically-driven, corporately controlled, heavily marketed, even environmentally-sound smart city, does not really raise these as valid questions to be addressed.

Contrary to dominant representations that urban development through the application of ICTs is both a positive and inevitable trend, the smart city concept raises more questions than it answers. The suggestion by giant IT consortiums that we need to become technologically smarter now to save our cities, and consider the social consequences later, is highly pre-emptive, not to mention, ideological. We should be wary of corporately-inspired smart scenarios where urban problems have all been solved by technology and all of its inhabitants are happy and prosperous, however tantalising this vision is. Underlying this idea is a more manipulative notion that cities are just 'machines for making money out of', or that global competitiveness between cities will automatically make them better places to live.

For too long, smart city discourses have been ignorant as to how cities actually work sociologically and politically, and the fact that they are made up of a complex and diverse set of dynamics and conflicts (Harvey, 2012). They also fail to ask important questions about urban life: why are most cities unequal places?; what economic system created the current ecological conditions?; how can cities organically develop and real communities form?; and, what is the good or fair city? (Toderian, 2012). We need better socio-political understandings of the city, and more novel approaches emphasising the need to see urban technological transformation within a wider social, political, economic, cultural and organisational context. And we need to engage very much with real-time citizen-led smart initiatives and cases studies, looking critically and carefully at the policy process, driving forces, power, and sociological context.

Many of our major urban problems are not technological, but social, like poverty and inequality, and have been exacerbated, not solved, by corporate privatisation and city branding strategies (Harvey, 2013). Additionally, there has been little room for people power, democratic debate, and citizen rights in many discussions of the smart city. Their

role has too often been limited to being in the right frame of mind to accept the inevitability of the smart city - i.e. to develop a smartmentality to cope with urban technological change. As Anttiroiko (2013:13) asks:

> Here, the critical question is whether u-city really benefits us all, or is it ultimately a capital affirmative endeavour of which construction companies and UbiTech firms reap the most benefit, public sector carries major risks through their support schemes and public investments, and people are made to adjust to a new technologically mediated mode of urban life, without much room for choices of their own.

Urban life, as urban sociology over the past century has shown us, is a multifaceted and complex thing. Problems like urban poverty, discrimination, inequality and social polarisation, issues like neighbourhood and community decline, crime and neglect, and even environmental problems like traffic congestion and recycling, have important social, political and cultural dimensions, and will not be ameliorated solely by simple technological solutions or more sophisticated data gathering. This is the paradox faced by any smart initiative - corporate or otherwise. Participation-based and citizen run interventions into the smart city give us no more than glimpses of what is and might be possible if IT was used progressively and in the service of urban dwellers, rather than as simply efficient high tech 'quick fixes', and corporate profit-making activities. The question is, can we afford not to consider different ideas of smartness beyond the corporate form?

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[i] For an interesting documentary along a similar theme to this see Adam Curtis' 2011 BBC2 production 'All Watched Over By Machines Of Loving Grace'.

[ii] For the Zeitgeist Movement see their website mission statement at: http://www.thezeitgeistmovement.com/mission-statement, while a 'live' description of the related (but now separate) Venus Project by Jacque Fresco, can be found at: http://www.thevenusproject.com/en/the-venus-project/about